DETAILED ACTION

1. This Office Action is in response to correspondence filed August 27, 2008 in reference to application 10/716,873. Claims 1-51 are pending and have been examined.

Response to Amendment

2. The amendment filed August 27 has been accepted and considered in this office action. Claims 1, 2, 4, 7, 8, 10, 11, 14, 15, 17, 18, 19, 21, 26, 30, and 34 have been amended, and claims 37-51 have been added.

Response to Arguments

3. Applicant's arguments filed August 27, 2008 have been fully considered but they are not persuasive.

4. With regards to applicant's arguments, see Remarks page 20, that in HOLMES "the alleged frequency blocks (i.e., the pixels) are not formed by a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band," the examiner respectfully disagrees. The pixels of the graph are not "randomly displayed" as alleged by the applicant. Instead, each Pixels color or intensity is representative of the magnitude of the transform at each time and frequency location in the time and frequency grid formed by the frequency axis and the time axis clearly displayed in the figure of HOLMES. As the signal in HOLMES must be a discrete digital signal in order

to be processed by an FFT, and therefore each of the axis must be discrete as well, and therefore the pixels of HOLMES do in fact form a grid where time and frequency bands intersect.

5. With regards to applicant's arguments, see Remarks page 21, that HOLMES "fails to teach or suggest that each pixel within the spectrogram is assigned index information dependent upon the location of the pixel in relation to the location of another pixel," the examiner respectfully disagrees. As discussed above, because the data in HOLMES is discrete data, the axis must be discrete as well. Therefore, as there is a discrete number of possible data point locations on each axis, each possible data point therefore becomes an "index," in Hz for frequency and mS for time.

6. With regards to applicant's arguments, see Remarks page 21, that the spectrograph in HOLMES "is not appropriate for searching for the nearest neighbor block, because, although the data type is advantageous to interpret the characteristic of a signal, it is disadvantageous to compare signals for searching for the nearest neighbor block," the examiner respectfully disagrees. As argued by the applicant, in order for the information to be conducive to "nearest neighbor" searching, the data must be scalar. As argued above, the axis and all data must be discrete, and is therefore by definition scalar data. Therefore the spectrograph in HOLMES is conducive to nearest neighbor processing.

7. With regards to applicant's arguments, see Remarks page 21, that "applying Hartung's encoding technique to the spectrogram does not result in the time-frequency table of claim 1, the examiner respectfully asserts that in this rejection and in previous rejections, only HOLMES was relied upon to teach a time-frequency table. The spectrogram itself is in fact a time frequency table. HARTUNG was relied upon merely to disclose nearest neighbor coding and generating a bitstream from the encoding.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. **Claims 1, 3-5, 7-12, 14, 16-22, 24, 26-28, 30, 31, 33-38, and 49-51** rejected under 35 U.S.C. 103(a) as being unpatentable over HARTUNG et al. (Patent No. US 5,309,232) in view of HOLMES et al. (Speech Synthesis and Recognition).

10. Regarding **claim 1**, HARTUNG teaches an encoding method comprising:

(b) searching for a nearest neighbor block of a block being currently encoded (see column 3, lines 33-60, equation 1), and generating information on the nearest neighbor block ("side information indicating which pixels are repeated from the previous frame", column 3, lines 62-64); and

(c) generating a bitstream containing the generated information on the nearest neighbor block ("multiplexed onto communication channel 345 for transmission to a decoder", column 4, lines 8-9).

However, HARTUNG does not disclose:

(a) performing a time-frequency transformation on the input audio signal, generating a time-frequency band table by dividing the transformed input audio signal into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an audio signal that is used to create an image. HOLMES teaches a digital audio signal encoding method ("generating spectrograms", p. 23, paragraph 2) comprising:

(a) performing a time-frequency transformation on the input audio signal (Fourier transform is used, page 23 paragraph 1), generating a time-frequency band table (see

Figure 2.11, "use the horizontal dimension for time, the vertical dimension for frequency", p. 23, paragraph 1) by dividing the transformed input audio signal into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index.).

wherein time-frequency band table includes a plurality of time frames, which have a time correlation ("columns" of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image encoding method of HARTUNG on the

spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently encode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

11. Regarding **claim 3**, HARTUNG and HOLMES further teach that the nearest neighbor block information is index information of the nearest neighbor block, which is searched for, in the time-frequency band table ("side information indicating which pixels are repeated from the previous frame", HARTUNG, column 3, lines 62-64, where the previous frame has an index at i,j, and t, see equation 1).

12. Regarding **claim 4**, HARTUNG further teaches {hat in step (b) a search scope of the nearest neighbor block includes blocks previous to the current block being currently encoded (see equation 1, x(i,j,t) occurs before x(i,j,t-1)).

13. Regarding **claim 5**, HARTUNG further teaches that in step (b) determination of the nearest neighbor block is based on the Euclidian distance between the current block and an object block (see equation 1, lx(i,j,t) -x(i,j,t-1)l is the distance between x(i,j,t) and x(i,j,t-1)).

14. Regarding **claim 7**, HARTUNG teaches an encoding method comprising:

(b) searching for a nearest neighbor block of a block being currently encoded (see column 3, lines 33-60, equation 1);

(c) based on the nearest neighbor block searched for, determining whether or not a block being currently encoded is a redundant block (see column 3, lines 33-60, equation 1); and

(d) based on the result determined in step (c), generating an output bitstream ("multiplexed onto communication channel 345 for transmission to a decoder", column 4, lines 8-9).

However, HARTUNG does not disclose:

(a) performing a time-frequency transformation on the input audio signal, generating a time-frequency band table by dividing the transformed input audio signal into a plurality of frequency blocks in each frame and a time-frequency index combination;

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an audio signal that is used to create an image. HOLMES teaches a digital audio signal encoding method ("generating spectrograms", p. 23, paragraph 2) comprising:

(a) performing a time-frequency transformation on the input audio signal (Fourier transform is used, page 23 paragraph 1), generating a time-frequency band table (see Figure 2.11, "use the horizontal dimension for time, the vertical dimension for frequency", p. 23, paragraph 1) by dividing the transformed input audio signal into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index.),

wherein time-frequency band table includes a plurality of time frames, which have a time correlation ("columns" of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the

corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image encoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently encode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

15. Regarding **claim 8**, HARTUNG further teaches that if it is determined in step (c) that the current block being currently encoded is the redundant block, the bitstream generated in step (c) includes nearest neighbor block information on the nearest neighbor block searched for in step (b), instead of current block information ("side information indicating which pixels are repeated from the previous frame", column 3, lines 62-64).

16. Regarding **claim 9**, HARTUNG and HOLMES further teach that the nearest neighbor block information is index information of the nearest neighbor block, which is searched for in the time-frequency band table ("side information indicating which pixels

are repeated from the previous frame", HARTUNG, column 3, lines 62-64, where the previous ,frame has an index at i,j, and t, see equation 1).

17. Regarding **claim 10**, HARTUNG further teaches that if it is determined in step (c) that the current block being currently encoded is not the redundant block, the bitstream generated in step (d) includes current block information (see equation 1, the current x is used if the distance is less than the threshold).

18. Regarding **claim 11**, HARTUNG further teaches that in step (b) a search scope of the nearest neighbor block includes blocks previous to the current block being currently encoded (see equation 1, x(i,j,t) occurs before x(i,j,t-1)).

19. Regarding **claim 12**, HARTUNG further teaches that in step (b) determination of the nearest neighbor block is based on the Euclidian distance between the current block and an object block (see equation 1, lx(i,j,t) - x(i,j,t-1)l is the distance between x(i,j,t) and x(i,j,t-1)).

20. Regarding **claim 14**, HARTUNG teaches an encoding apparatus comprising:

a nearest neighbor block searching and nearest neighbor block information generation unit which searches for a nearest neighbor block of a current block being currently encoded (see column 3, lines 33-60, equation 1), and generates information

on the nearest neighbor block ("side information indicating which pixels are repeated from the previous frame", column 3, lines 62-64); and

a bitstream packing unit which generates a bitstream containing the generated information on the nearest neighbor block ("multiplexed onto communication channel 345 for transmission to a decoder", column 4, lines 8-9).

However, HARTUNG does not disclose a time-frequency band table generation unit which generates a time-frequency band table by dividing an input audio signal, on which time- frequency transformation is performed, into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an audio signal that is used to create an image. HOLMES teaches a digital audio signal encoding apparatus ("generating spectrograms", p. 23, paragraph 2) comprising:

a time-frequency band table generation unit which generates a time-frequency band table (see Figure 2.11, "use the horizontal dimension for time, the vertical dimension for frequency", p. 23, paragraph 1) by dividing an input audio signal, on which time- frequency transformation is performed, into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index.)

wherein time-frequency band table includes a plurality of time frames, which have a time correlation ("columns" of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.)

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image encoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently encode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

21. Regarding **claim 16**, HARTUNG and HOLMES further teaches that the nearest neighbor block information is index information of the nearest neighbor block, which is searched for in the time-frequency band table ("side information indicating which pixels are repeated from the previous frame", HARTUNG, column 3, lines 62-64, where the previous frame has an index at i,j, and t, see equation 1).

22. Regarding **claim 17**, HARTUNG teaches an encoding apparatus comprising:

a nearest neighbor block searching unit which searches for a nearest neighbor block of a current block being currently encoded (see column 3, lines 33-60, equation 1);

a redundant block decision unit which, based on the nearest neighbor block, determines whether or not the block being currently encoded is a redundant block (see column 3, lines 33-60, equation 1); and

a bitstream packing unit which, based on the result determined in the redundant block decision unit, generates an output bitstream ("multiplexed onto communication channel 345 for transmission to a decoder", column 4, lines 8-9).

However, HARTUNG does not disclose a time-frequency band table generation unit which generates a time-frequency band table by dividing an input audio signal, on which time- frequency transformation is performed, into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an audio signal that is used to create an image. HOLMES teaches a digital audio signal encoding apparatus ("generating spectrograms", p. 23, paragraph 2) comprising:

a time-frequency band table generation unit which generates a time-frequency band table (see Figure 2.11, "use the horizontal dimension for time, the vertical dimension for frequency", p. 23, paragraph 1) by dividing an input audio signal, on

which time- frequency transformation is performed, into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index.),

wherein time-frequency band table includes a plurality of time frames, which have a time correlation (“columns” of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image encoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels

corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently encode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

23. Regarding **claim 18**, HARTUNG further teaches that if the redundant block decision unit determines that the current block being currently encoded is the redundant block, the bitstream generation unit includes information on the nearest neighbor block which is searched for in the nearest neighbor block searching unit, in the output bitstream instead of current block information ("side information indicating which pixels are repeated from the previous frame", column 3, lines 62-64).

24. Regarding **claim 19**, HARTUNG further teaches that if the redundant decision unit determines that the current block being currently encoded is not the redundant block, the bitstream generation unit includes the current block information in the output bitstream (see equation 1, the current x is used if the distance is less than the threshold).

25. Regarding **claim 20**, HARTUNG and HOLMES further teach that the nearest neighbor block information is index information of the nearest neighbor block, which is searched for in the time-frequency band table ("side information indicating which pixels are repeated from the previous frame", HARTUNG, column 3, lines 62-64, where the previous frame has an index at i,j, and t, see equation 1).

26. Regarding **claim 21**, HARTUNG teaches a decoding method ("decoder", column 5, line 31) for decoding a signal containing additional information ("side information", column 5, line 33) on a predetermined region of the signal ("remaining subbands", column 3, lines 7-10), comprising:

(a) decoding a block which is not included in the predetermined region ("determine which areas of the subbands.., have been zeroed out", column 5, lines 34-38), from an input bitstream ("coded signals", column 5, line 32);

(b) performing a time-frequency transformation on the decoded block data, generating an image corresponding to the predetermined region ("performs the operations of the subband analysis unit 300 in reverse to reconstruct the images", column 5, lines 42-43); and

(c) reconstructing a current block included in the predetermined region ("determine which areas of the subbands have been repeated from the previously encoded subband", column 5, lines 34-36), based on the additional information ("side information", column 5, line 33) on the predetermined region of the signal ("remaining subbands", column 3, lines 7-10).

However HARTUNG does not disclose that decoding is done on an audio signal or that the image is a time-frequency band table formed by dividing the transformed decoded block data into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an image that represents an audio signal. HOLMES teaches a time-frequency band table ("spectrogram", see Figure 2.11) formed by dividing the transformed decoded block data into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index),

wherein time-frequency band table includes a plurality of time frames, which have a time correlation (“columns” of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the

plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.)

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image decoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently decode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

27. Regarding **claim 22**, HARTUNG further teaches that the additional information includes index information on a nearest neighbor block of a current block in the predetermined region ("side information indicating which pixels are repeated from the previous frame", column 3, lines 62-64, where the previous frame has an index at i,j, and t, see equation 1).

28. Regarding **claim 24**, HARTUNG and HOLMES further teach the time-frequency band table generated in step (b) is updated by the current block reconstructed in step (c) ("determine which areas of the subbands have been repeated from the previously encoded subband", HARTUNG, column 5, lines 34-36, using the repeated subbands to generate the image is inherent).

29. Regarding **claim 26**, HARTUNG teaches a decoding method ("decoder", column 5, line 31) for decoding a signal comprising:

(a) extracting nearest neighbor block information ("side information", column 5, line 33) from an input bitstream ("coded signals", column 5, line 32);

(b) performing a time-frequency transformation on the bitstream, generating an image ("performs the operations of the subband analysis unit 300 in reverse to reconstruct the images", column 5, lines 42-43);

(c) based on the extracted nearest neighbor block information, determining whether or not a block being currently decoded is a redundant block ("determine which areas of the subbands have been repeated from the previously encoded subband", column 5, lines 34-36); and

(d) if the block being currently decoded is the redundant block, reconstructing the redundant block ("determine which areas of the subbands have been repeated from the previously encoded subband", column 5, lines 34-36) based on the extracted nearest neighbor block information ("side information", column 5, line 33).

However HARTUNG does not disclose that decoding is done on an audio signal or that the image is a time-frequency band table formed by dividing the transformed decoded block data into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an image that represents an audio signal. HOLMES teaches a time-frequency band table ("spectrogram", see Figure 2.11) formed by dividing the transformed decoded block data into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index)

wherein time-frequency band table includes a plurality of time frames, which have a time correlation (“columns” of pixels which are oriented along the time axis),

arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.),

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image decoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently decode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

30. Regarding **claim 27**, HARTUNG and HOLMES further teach reconstructing an entire spectrum corresponding to the input audio bitstream by using the reconstructed

redundant block ("performs the operations of the subband analysis unit 300 in reverse to reconstruct the images", HARTUNG, column 5, lines 42-43, where the image is a complete spectrogram according to HOLMES, the spectrogram representing the entire spectrum of an audio signal, see HOLMES, Figure 2.11).

31. Regarding **claim 28**, HARTUNG and HOLMES further teach that step (c) further comprises:

updating the time-frequency band table based on the reconstructed redundant block ("determine which areas of the subbands have been repeated from the previously encoded subband", HARTUNG, column 5, lines 34-36, using the repeated subbands to generate the image is inherent).

32. Regarding **claim 30**, HARTUNG teaches a decoding apparatus ("decoder", column 5, line 31) for decoding a signal containing additional information ("side information", column 5, line 33) on a predetermined region of the signal ("remaining subbands", column 3, lines 7-10) comprising:

a decoding unit which decodes a block which is not included in the predetermined region ("determine which areas of the subbands.., have been zeroed out", column 5, lines 34-38), from an input bitstream ("coded signals", column 5, line 32); and

a post-processing unit which, performs a time-frequency transformation on the decoded block data, generates an image corresponding to the predetermined region

("performs the operations of the subband analysis unit 300 in reverse to reconstruct the images", column 5, lines 42-43), and reconstructs a current block included in the predetermined region ("determine which areas of the subbands have been repeated from the previously encoded subband", column 5, lines 34-36), based on the additional information ("side information", column 5, line 33) on the predetermined region of the signal ("remaining subbands", column 3, lines 7-10).

However HARTUNG does not disclose that decoding is done on an audio signal or that the image is a time-frequency band table formed by dividing the transformed decoded block data into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an image that represents an audio signal. HOLMES teaches a time-frequency band table ("spectrogram", see Figure 2.11) formed by dividing the transformed decoded block data into a plurality of

frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index)

wherein time-frequency band table includes a plurality of time frames, which have a time correlation ("columns" of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image decoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels

corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently decode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

33. Regarding **claim 31**, HARTUNG further teaches that the additional information includes index information on a nearest neighbor block of a current block in the predetermined region ("side information indicating which pixels are repeated from the previous frame", column 3, lines 62-64, where the previous frame has an index at i,j, and t, see equation 1).

34. Regarding **claim 33**, HARTUNG and HOLMES further teach that the generated time-frequency band table is updated by a reconstructed current block ("determine which areas of the subbands have been repeated from the previously encoded subband", HARTUNG, column 5, lines 34-36, using the repeated subbands to generate the image is inherent).

35. Regarding **claim 34**, HARTUNG teaches a decoding apparatus ("decoder", column 5, line 31) for decoding a signal comprising:

a nearest neighbor block information extracting unit which extracts nearest neighbor block information ("side information"; column 5, line 33) from an input bitstream ("coded signals", column 5, line 32);

an image generation unit which, based on the input bitstream, generates an image ("performs the operations of the subband analysis unit 300 in reverse to reconstruct the images", column 5, lines 42-43); and

a redundant block reconstruction unit which, based on the extracted nearest neighbor block information, determines whether or not a block being currently decoded is a redundant block ("determine which areas of the subbands have been repeated from the previously encoded subband", column 5, lines 34-36), and if the block being currently decoded is the redundant block, the redundant block reconstruction unit reconstructs the redundant block ("determine which areas of the subbands have been repeated from the previously encoded subband", column 5, lines 34-36) based on the extracted nearest neighbor block information ("side information", column 5, line 33).

However HARTUNG does not disclose that decoding is done on an audio signal or that the image is a time-frequency band table, performing a time-frequency transformation on the input audio signal, generating a time-frequency band table by dividing the transformed input audio signal into a plurality of frequency blocks in each frame and a time-frequency index combination,

wherein time-frequency band table includes a plurality of time frames, which have a time correlation, arranged to intersect with a plurality of frequency bands, which range from a lowest frequency band to a highest frequency band, to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands, and

each frequency block is assigned index information including a time frame index and a frequency band index, the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block.

In the same field of media analysis, HOLMES discloses an image that represents an audio signal. HOLMES teaches a time-frequency band table ("spectrogram", see Figure 2.11) performing a time-frequency transformation on the input audio signal (Fourier transform is used, page 23 paragraph 1), generating a time-frequency band table (see Figure 2.11, "use the horizontal dimension for time, the vertical dimension for frequency", p. 23, paragraph 1) by dividing the transformed input audio signal into a plurality of frequency blocks in each frame and a time-frequency index combination (paragraph 2, the plot shows the value of the Fourier transform at a particular time at a particular frequency. Each pixel becomes a frequency block at each frame, forming a time-frequency index.),

wherein time-frequency band table includes a plurality of time frames, which have a time correlation ("columns" of pixels which are oriented along the time axis), arranged to intersect with a plurality of frequency bands (time columns intersect with frequency rows), which range from a lowest frequency band to a highest frequency band (0-5k on the scale), to form the plurality of frequency blocks such that each frequency block corresponds to one of the plurality of time frames and one of the plurality of frequency bands (each column and row each meet at a single pixel, representing a frequency block), and

each frequency block is assigned index information including a time frame index and a frequency band index (discrete time location on time axis), the index information of a corresponding frequency block being dependent upon a location of the corresponding frequency block within the time-frequency table relative to a location and the index information of the current block (each block also must be contained in a discrete frequency row, which would be the frequency index.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the image decoding method of HARTUNG on the spectrogram of HOLMES, where each pixel of the spectrogram corresponds to the energy of the audio signal at single time and frequency, and a small column of pixels corresponds to the energy in a subband at a single time. This would have been done in order to more efficiently decode the spectrogram by taking advantage of the temporal correlations within the subbands (see HARTUNG, column 3, lines 9-12).

36. Regarding **claim 35**, HARTUNG and HOLMES further teach that the redundant block reconstruction unit reconstructs an entire spectrum corresponding to the input audio bitstream by using the reconstructed redundant block ("performs the operations of the subband analysis unit 300 in reverse to reconstruct the images", HARTUNG, column 5, lines 42-43, where the image is a complete spectrogram according to HOLMES, the spectrogram representing the entire spectrum of an audio signal, see HOLMES, Figure 2.11).

37. Regarding **claim 36**, HARTUNG and HOLMES further teach that the time-frequency band table generation unit updates the time-frequency band table based on the reconstructed redundant block ("determine which areas of the subbands have been repeated from the previously encoded subband", HARTUNG, column 5, lines 34-36, using the repeated subbands to generate the image is inherent).

38. Regarding **claim 37**, HOLMES further teaches each of the plurality of frequency bands has a plurality of spectrum coefficients (as shown in figure 2, each frequency "row" or band has a plurality of coefficients "pixels" corresponding to different times.).

39. Regarding **claim 38**, HOLMES further teaches the time-frequency table includes data of a scalar type (As the data of HOLMES is digital data, it must be discrete as well, and is therefore scalar. Therefore all data on the table of HOLMES is scalar in nature).

40. Regarding **claim 49**, HOLMES further teaches each of the plurality of frequency blocks has a plurality of spectrum coefficients (as shown in figure 2, each frequency "row" or band has a plurality of coefficients "pixels" corresponding to different times.).

41. Regarding **claim 50**, HOLMES further teaches the plurality of frequency blocks are arranged in a grid to form the time-frequency band table (each pixel represents a small band of frequencies at each time band. therefore this is by definition of time-frequency band table).

42. Regarding **claim 51**, HOMLES and HARTUNG further teach the current block is one of the plurality of frequency blocks being currently encoded and varies as a different block of the plurality of frequency blocks is selected to be encoded (this is the current coordinate in HARTANG), and the index information of the corresponding frequency block varies according to the location of the corresponding frequency block in relation to the location and the index information of the current block (as discussed, HOLMES is discrete data, and therefore corresponds to discrete data points, such as coordinates in HARTUNG, which is an index that varies as new coordinates are chosen).

43. **Claims 2, 15, 23, 32, 39, 40, and 46** rejected under 35 U.S.C. 103(a) as being unpatentable over HARTUNG et al. (Patent No. US 5,309,232) in view of HOLMES et al. (Speech Synthesis and Recognition) in further view of NAKAMURA (Patent No.: US 6,226,325).

44. Regarding **claim 2**, HARTUNG and HOLMES teach all of the claimed limitations of claim 1.

However, HARTUNG and HOLMES do not disclose the frequency of the encoded blocks.

In the same field of media analysis, NAKAMURA discloses the compression of high-frequency content. NAKAMURA teaches determining whether the frequency of the current block being currently encoded is equal to or greater than a threshold frequency

corresponding to a high frequency band (see FIG. 1A, the high frequency signal is encoded separately), and that the bitstream includes block information on a current block when the current block is included in a frequency band lower than the threshold frequency (see FIG. 1A, the output bitstream contains both high and low frequency information) and nearest neighbor block information of a block included in a frequency band equal to or higher than the threshold frequency (see FIG. 1A, only the high frequency portion of the signal is compressed).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the encoding method of HARTUNG and HOLMES on the high frequency portion of signal as taught by NAKAMURA in order to reduce the number of bits required for storage (see NAKAMURA, column 3, lines 45-49).

45. Regarding **claim 15**, HARTUNG and HOLMES teach all of the claimed limitations of claim 14.

However, HARTUNG and HOLMES do not disclose the frequency of the encoded blocks.

In the same field of media analysis, NAKAMURA discloses the compression of high-frequency content. NAKAMURA teaches that the frequency of a block being currently encoded is equal to or greater than a threshold frequency (see FIG. 1A, the high frequency signal is encoded separately), and that the bitstream includes block information on a block included in a frequency band lower than the threshold frequency (see FIG. 1A, the output bitstream contains both high and low frequency information)

and nearest neighbor block information of a block included in a frequency band equal to or higher than the threshold frequency (see FIG. 1A, only the high frequency portion of the signal is compressed).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the encoding apparatus of HARTUNG and HOLMES on the high frequency portion of signal as taught by NAKAMURA in order to reduce the number of bits required for storage (see NAKAMURA, column 3, lines 45-49).

46. Regarding **claim 23**, HARTUNG and HOLMES teach all of the claimed limitations of claim 21.

However, HARTUNG and HOLMES do not disclose the frequency of the decoded blocks.

In the same field of media analysis, NAKAMURA discloses the compression of high-frequency content. NAKAMURA teaches that the predetermined region is a high frequency region (see FIG. 1B, only the high frequency portion of the signal is decoded).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decoding method of HARTUNG and HOLMES on the high frequency portion of signal as taught by NAKAMURA in order to reduce the number of bits required for storage (see NAKAMURA, column 3, lines 45-49).

47. Regarding **claim 32,** HARTUNG and HOLMES teach all of the claimed limitations of claim 30.

However, HARTUNG and HOLMES do-not disclose the frequency of the decoded blocks.

In the same field of media analysis, NAKAMURA discloses the compression of high-frequency content. NAKAMURA teaches that the predetermined region is a high frequency region (see FIG. 1B, only the high frequency portion of the signal is decoded).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the decoding apparatus of HARTUNG and HOLMES on the high frequency portion of signal as taught by NAKAMURA in order to reduce the number of bits required for storage (see NAKAMURA, column 3; lines 45-49).

48. Regarding **claim 39**, HARTUNG and HOLMES further teach the block information is the index information of the current block and the nearest neighbor block information is the index information of the nearest neighbor block (is discrete data, the axis must be discrete as well. Therefore, as there is a discrete number of possible data point locations on each axis, each possible data point therefore becomes an “index,” in Hz for frequency and mS for time. Further, HARTUNG operates on the (i,j,t) discrete indexes as seen in equation 1.).

49. Regarding **claim 40**, NAKAMURA further teaches only a portion of the audio signal corresponding to frequency bands less than the threshold frequency corresponding to the high frequency band is encoded and included in the bitstream generated to be output (Figures 1A, only low frequency information is passed directly to the formatter).

50. Regarding **claim 46**, HARTUNG and HOLMES teach all of the claimed limitations of claim 1, wherein the block information is the index information of the current block and the nearest neighbor block information is the index information of the nearest neighbor block (is discrete data, the axis must be discrete as well. Therefore, as there is a discrete number of possible data point locations on each axis, each possible data point therefore becomes an "index," in Hz for frequency and mS for time. Further, HARTUNG operates on the (i,j,t) discrete indexes as seen in equation 1.).

However, HARTUNG and HOLMES do not disclose the frequency of the encoded blocks.

In the same field of media analysis, NAKAMURA discloses the compression of high-frequency content. NAKAMURA teaches determining whether the frequency of the current block being currently encoded is equal to or greater than a threshold frequency corresponding to a high frequency band (see FIG. 1A, the high frequency signal is encoded separately), and that the bitstream includes block information on a current block when the current block is included in a frequency band lower than the threshold frequency (see FIG. 1A, the output bitstream contains both high and low frequency

information) and nearest neighbor block information of a block included in a frequency band equal to or higher than the threshold frequency (see FIG. 1A, only the high frequency portion of the signal is compressed).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the encoding method of HARTUNG and HOLMES on the high frequency portion of signal as taught by NAKAMURA in order to reduce the number of bits required for storage (see NAKAMURA, column 3, lines 45-49).

51. **Claims 6, 13, 25, and 29** rejected under 35 U.S.C. 103(a) as being unpatentable over HARTUNG et al. (Patent No. US 5,309,232) in view of HOLMES et al. (Speech Synthesis and Recognition) in further view of ZIBMAN et al. (Patent No.: US 4,748,579).

52. Regarding **claim 6**, HARTUNG and HOLMES teach all of the claimed limitations of claim 1.

However, HARTUNG and HOLMES do not disclose the use of scale factors.

In the same field of media analysis, ZIBMAN discloses using scale factors to represent frequency data. ZIBMAN teaches that the nearest neighbor block information includes scale factor information ("computing the scale factor", column 7, line 29).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to represent the encoded information of HARTUNG and HOLMES

using scale factors as taught by ZIBMAN in order scale the numbers to a certain number of bits (see ZIBMAN, column 7, lines 27-58).

53. Regarding **claim 13**, HARTUNG and HOLMES teach all of the claimed limitations of claim 7.

However, HARTUNG and HOLMES do not disclose the use of scale factors.

In the same field of media analysis, ZIBMAN discloses using scale factors to represent frequency data. ZIBMAN teaches that the nearest neighbor block information includes scale factor information ("computing the scale factor", column 7, line 29).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to represent the encoded information of HARTUNG and HOLMES using scale factors as taught by ZIBMAN in order scale the numbers to a certain number of bits (see ZIBMAN, column 7, lines 27-58).

54. Regarding **claim 25**, HARTUNG and HOLMES teach all of the claimed limitations of claim 21.

However, HARTUNG and HOLMES do not disclose the use of scale factors.

In the same field of media analysis, ZIBMAN discloses using scale factors to represent frequency data. ZIBMAN teaches that the additional information includes scale factor information ("computing the scale factor", column 7, line 29).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to represent the encoded information of HARTUNG and HOLMES

using scale factors as taught by ZIBMAN in order scale the numbers to a certain number of bits (see ZIBMAN, column 7, lines 27-58).

55. Regarding **claim 29**, HARTUNG and HOLMES teach all of the claimed limitations of claim 27.

However, HARTUNG and HOLMES do not disclose the use of scale factors. In the same field of media analysis, ZIBMAN discloses using scale factors to represent frequency data. ZIBMAN teaches that the nearest neighbor block information includes scale factor information ("computing the scale factor", column 7, line 29). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to represent the encoded information of HARTUNG and HOLMES using scale factors as taught by ZIBMAN in order scale the numbers to a certain number of bits (see ZIBMAN, column 7, lines 27-58).

56. **Claims 41-44** are rejected under 35 U.S.C. 103(a) as being unpatentable over HARTUNG et al. (Patent No. US 5,309,232) in view of HOLMES et al. (Speech Synthesis and Recognition) as applied to claim 1 above, and further view of HASTIE et al. (Discriminant Adaptive Nearest Neighbor Classification).

57. Regarding **claim 41**, HARTUNG and HOLMES teach all of the claimed limitations of claim 4.

However, HARTUNG and HOLMES do not disclose the blocks previous to the current block include previous blocks of lower frequency bands in a current frame which the current block is located and blocks of a predetermined number of previous frames.

In the same field of Nearest Neighbor searching, HASTIE teaches searching for nearest neighbors in multiple directions (see figure 1, both horizontal and vertical axis are search using circle regions.).

Therefore it would have been obvious to apply searching along multiple axes as taught by HASTIE to the searching of HARTUNG in order to allow redundancies along other axes such as (i and j) or frequency when applied to HOLMES, to be detected and therefore increasing the efficiency of the coding.

58. Regarding **claim 42**, HARTUNG, HOLMES, and HASTIE further teach the nearest neighbor block is a previous block which is searched for in the time-frequency band table and is the least different from the current block (As discussed, in the rejection of claim 1, the nearest neighbor searching of HARTUNG is applied to the spectrograph of HOLMES, which is in fact a time-frequency band table. HARTUNG equation 1 subtracts 1, and therefore guarantees the previous block detected is different than the current block.).

59. Regarding **claim 43**, HARTUNG and HOLMES teach all of the claimed limitations of claim 5, wherein the nearest neighbor block is the object block which has a

least Euclidian distance among blocks previous to the current block (see equation 1, |x(i,j,t) -x(i,j,t-1)| is the distance between x(i,j,t) and x(i,j,t-1)).

However, HARTUNG and HOLMES do not disclose including previous blocks of lower frequency bands in a current frame which the current block is located and blocks of a predetermined number of previous frames.

In the same field of Nearest Neighbor searching, HASTIE teaches searching for nearest neighbors in multiple directions (see figure 1, both horizontal and vertical axis are search using circle regions.).

Therefore it would have been obvious to apply searching along multiple axes as taught by HASTIE to the searching of HARTUNG in order to allow redundancies along other axes such as (i and j) or frequency when applied to HOLMES, to be detected and therefore increasing the efficiency of the coding.

60. Regarding **claim 44**, HARTUNG, HOLMES, and HASTIE further teach the nearest neighbor block is a previous block which is the least different from the current block (HARTUNG equation 1 subtracts 1, and therefore guarantees the previous block detected is different than the current block).

61. **Claims 45** are rejected under 35 U.S.C. 103(a) as being unpatentable over HARTUNG et al. (Patent No. US 5,309,232) in view of HOLMES et al. (Speech Synthesis and Recognition) in further view of HASTIE et al. (Discriminant Adaptive

Nearest Neighbor Classification) as applied to claim 43 above and further in view of NAKAMURA (Patent No.: US 6,226,325).

62. Regarding **claim 45**, HARTUNG, HOLMES, and HASTIE teach all of the claimed limitations of claim 43.

However, HARTUNG, HOLMES, and HASTIE do not disclose only a portion of the audio signal corresponding to frequency bands less than a threshold frequency corresponding to a high frequency band is encoded and included in the bitstream generated to be output.

In the same field of media analysis, NAKAMURA discloses only a portion of the audio signal corresponding to frequency bands less than a threshold frequency corresponding to a high frequency band is encoded and included in the bitstream generated to be output (Figures 1A, only low frequency information is passed directly to the formatter, high frequencies are first compressed).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the encoding method of HARTUNG ,HOLMES, and HASTIE on the high frequency portion of signal as taught by NAKAMURA in order to reduce the number of bits required for storage (see NAKAMURA, column 3, lines 45-49).

63. **Claims 47 and 48** are rejected under 35 U.S.C. 103(a) as being unpatentable over HARTUNG et al. (Patent No. US 5,309,232) in view of HOLMES et al. (Speech

Synthesis and Recognition) in view of NAKAMURA (Patent No.: US 6,226,325) as applied to claim 46 above, and further view of HASTIE et al. (Discriminant Adaptive Nearest Neighbor Classification).

64. Regarding **claim 47**, HARTUNG, HOLMES, and NAKAMURA teach all the limitations of claim 46.

However, HARTUNG, HOLMES, and NAKAMURA do not specifically disclose the blocks previous to the current block include previous blocks of lower frequency bands in a current frame which the current block is located and blocks of a predetermined number of previous frames

In the same field of Nearest Neighbor searching, HASTIE teaches searching for nearest neighbors in multiple directions (see figure 1, both horizontal and vertical axis are search using circle regions.).

Therefore it would have been obvious to apply searching along multiple axes as taught by HASTIE to the searching of HARTUNG in order to allow redundancies along other axes such as (i and j) or frequency when applied to HOLMES, to be detected and therefore increasing the efficiency of the coding.

65. Regarding **claim 48**, HARTUNG, HOLMES, and NAKAMURA teach all the limitations of claim 47, wherein the determining is based on the Euclidian distance between the current block and an object block (HARTUNG, see equation 1, $|x(i,j,t) - x(i,j,t-1)|$ is the distance between $x(i,j,t)$ and $x(i,j,t-1)$)

However, HARTUNG, HOLMES, and NAKAMURA do not specifically disclose the blocks previous to the current block include previous blocks of lower frequency bands in a current frame which the current block is located and blocks of a predetermined number of previous frames

In the same field of Nearest Neighbor searching, HASTIE teaches searching for nearest neighbors in multiple directions (see figure 1, both horizontal and vertical axis are search using circle regions.).

Therefore it would have been obvious to apply searching along multiple axes as taught by HASTIE to the searching of HARTUNG in order to allow redundancies along other axes such as (i and j) or frequency when applied to HOLMES, to be detected and therefore increasing the efficiency of the coding.

Conclusion

66. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS C. GODBOLD whose telephone number is (571)270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D.C.G./

10/27/2008

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